

Enhancement of Learning & Teaching Online.

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Issue:

Digital technology does not have any inherent educational value and requires a pedagogical approach and purposeful design usually associated with any designed artefact (Phillips, McNaught & Kennedy, 2012). Commonly implemented learning management systems (e.g. Blackboard) are technologies that integrate a number of functions for learning management and are designed to require minimal technological knowhow. It is generally left to the subject teachers or co-ordinators to develop their subject's online site to whatever degree they recognise as appropriate. However there is often little information that teachers can refer to to evaluate the pedagogical effectiveness of their online presence without having to develop specialist knowledge in the field.

While an LMS makes online teaching and learning available to all teachers, without an effective framework with which to align the technology to sound pedagogy the result can often be ineffective and simply create an additional time burden for the teacher.

Background:

In the latter decades of the 20th century Computer Aided Learning (CAL) as designed for technology of the time was applicable to single learners, each sitting before a computer in a designated room (a computer lab). Although it was not uncommon for there to be two students sitting at a computer there was very little communication other than having to sort out technical difficulties. Most learning was done from "Learning Packages" which by the end of the century were commonly put on CD-ROMS. Much of the effectiveness of digital technology at that time was simply due to it being seen as innovative and novel. For the student the CAL program was something of an extension of the games console - but never as fun.

With CDs and later with the introduction of the internet much of the content developed was considered only suitable for distance (or off-campus) education. Integration of CAL into

normal face-to-face teaching programs was very ad hoc and innovative, usually the product of specialist developers or enthusiast *early adopters* (Moore, 2002), (Coopman, 2009).

The introduction of the Learning Management System (LMS), such as Blackboard in 1997, enabled teachers to access the internet without any particular technical skills in HTML development. This began a shift away from the technological predominance of information and communication technology (ICT) and allowed for a more accessible and, consequently, unstructured approach. This development also enabled a shift away from online education being seen as form of distance education to the development of the notion of “hybrid” or “blended learning”, in which a component of the teaching program incorporates online instruction to varying degrees. By about 2002 there was given some consideration to the implementation of the LMS at a systemic level across all subjects within universities (van der Craats, 2002).

With the introduction of web 2 technologies around 2004 users were able to interact and participate more in the content and these developments were incorporated into the LMS. This has had a profound effect on the pedagogical possibilities of online learning and teaching as much as it has on the lives of the students themselves, most of whom now engage with the digital world as much as they do their face-to-face life. Living blended lives, as it were.

Current status:

Whereas at the start of the century digital technologies could rely on a “gee whiz” advantage to show some sort of improvement in learning (Coopman, 2009), it now has to situate itself within a “so what” reality, but does so tentatively. While online education has integrated itself into every student’s learning environment it has not quite been incorporated into every teacher’s teaching process. While there is no particular imperative to engage with ICT, and indeed some advantages to not use it was recognised early on (Johnson, Aragon, Shaik & Palma-Rivas, 2000) and holds true today. The expectations of the current generation of students demand high quality ICT experience that in some way matches their experience outside of the formal educational environment.

Since the period of introduction of the LMS most educational institutions have implemented a version of this technology for all subjects that enables teachers to engage with and incorporate digital information and learner management in the provision of their teaching programs. An LMS is designed to align the information provided online with the face-to-face teaching schedule and objectives. Each subject is provided with a “presence” that usually ensures that all subjects undertaken by a student are consistently represented. Students and teachers can access and use the LMS using technical skills that they would be familiar with in other contexts (mostly typing). However the organisation of the subject is allowed to be as flexible as possible to ensure that teachers have “ownership” and are able to align the content with their specific requirements and expectations.

For educational institutions most learning and teaching is face-to-face classroom instruction and the online component is often seen as supplementary to this and in many cases the technology of the LMS remains under-utilised.

Many teachers have not engaged with the possibilities of the digital environment, mainly because they tend to teach as they themselves were taught, creating a generational differentiation between teachers and students (Prensky, 2001). The main factors that restrict teachers from using an LMS more effectively, other than previous experience, is the perception that it creates an additional time burden or they simply do not know how to effectively use the technology. The information available to teaching staff is often of a technical nature or is tucked away in some obscure institutional web site and familiarising themselves with it requires more time and effort than the teacher has available. As a result most subject sites on an LMS generally take a basic approach.

The initial state for each course is typically a subject outline and staff contact details, a link to the university handbook and information about assessment (Harris & Jones, 2007). This allows for some form of consistency of expectation for the students and provides implicit encouragement for the teachers to enhance it over time.

The first useful enhancement often occurs with the addition of a lecture schedule and information regarding assessment. Assessments are uploaded through the LMS, usually in order to facilitate access to the Turnitin software for validation and record keeping purposes. This is purely using the LMS as an administrative tool and other than some learning

management advantage this offers no particular pedagogical aspects. It does allow for further iteration (van der Craats et al, 2002) (Harris & Jones 2007, p36).

The second level commonly used is that of using the LMS to distribute documents (van der Craats et al, 2002) which simply involves cutting and pasting lists of reading materials (usually pdf's) for the students to download, the advantage being that the students have immediate access and that the links can be placed within the context of the lecture schedule and the other information to which they pertain.

Conclusion

While the fundamental application of the LMS is extremely useful this is not the end of the story and there needs to be some consideration given to how teachers may extend this usefulness beyond the technology so that it becomes a useful tool for learning (Jonassen, 2000).

For teachers to move beyond the technological to the pedagogical there needs to be a clear conceptual framework by which teachers can be informed as to how to improve upon this initial state. Usually this requires some knowledge of the possibilities digital technology makes available and a clear process by which teachers can iteratively improve and extend their use of the LMS. (Phillips, McNaught & Kennedy, 2012)

It needs to be recognised that learning management systems are also teaching management systems and as such provide teachers with a tool for developing their subject, gathering and archiving resources and examples and, importantly, collaboration with other teachers. Teachers need to learn to work through their subject's online site rather than see it as being additional to their work load.

An LMS can provide various levels of access so that the information can be open to a range of stakeholders such as; other teachers, the school generally and to parents who may wish to know what their children are currently studying. An LMS usually offers various levels of access that allows for this transparency to occur.(Blackboard Help, Course Roles, 2014)

Recommendations:

What teachers require is a clear conceptual framework with which they can structure an approach to the adoption and sustainable application of digital educational technology, as represented by the LMS. Aligned to this framework they need a process of implementation this is efficient, particularly in terms of time and work load and effective in that it actually improves and enables better outcomes.

A conceptual framework that can be applied to this issue is the SOLO taxonomy developed by Biggs and Collis (2014). The SOLO taxonomy is designed to ensure that intended learning outcomes provide for a range of levels of cognitive engagement in any learning activity (Biggs & Collis 2014). While this is accepted as being true for specific learning outcomes it can also be adapted to the more general objectives an entire subject or course of study. Aligning the use of digital technologies to the SOLO taxonomy gives teachers a clear indication upon which they can evaluate the pedagogical effectiveness of their subject.

In terms of evaluation and a strategy of implementation the same framework can be used as a plan or checklist that will allow for very specific targeting of areas in need of development or improvement. Teachers can build upon previous experience to construct a more sophisticated approach to their use of the LMS in their teaching environment.

The SOLO schema identifies five levels of pedagogic (as opposed to administrative) engagement between the subject and the student(s):

Pre-structural –This is a level at which the students are simply offered information about the subject without any pedagogical purpose for the web presence. Students are able to identify the intended learning objectives within the time schedule of the subject. The chief advantage of this is that there is some alleviation of confusion and students are provided with a clear learning pathway.

This level is usually provided for through an administrative process. while it is informative it is intended to allow for and encourage uptake by the teacher. For students, to have each subject of a course represented enables them to conceptualise what lays before them in their program of study. For teachers, there is enormous value in that teachers participating

in courses can see what the students are being taught in other subjects and be more coordinated in their approach. In this way the online site demonstrates how the curriculum is embodied.

Uni-structural – This is the level at which students are provided with information, such as PDFs and external links, that support their in-class activities. The activities are described and the criteria by which they will be assessed is articulated and demonstrated. This is very much about support for face-to-face teaching rather than extending it. With the introduction of smart boards and the use of powerpoint presentations teachers are able to use the LMS as a repository and the same material can be used in the class room or lecture theatre. This has some advantage in terms of work load and can provide coordination and consistency when a number of teachers teach the same subject.

Multi-structural – At this level students are engaged in the use of the online site for learning activities and assessment. Discussion forums are integrated into the learning process to facilitate asymmetric communication between students and teachers to develop a community of enquiry (Garrison, R.D. 2011).

Students can refer to the LMS site if they miss a class or need to review previous classes. Course management is aligned with the teaching schedule.

This level builds upon the previous level in that it seeks to alleviate confusion and the resulting anxiety students can often have in regards to what is expected of them. Another advantage of this level is that students can clearly see where they sit in the learning process. They are aware of what the prerequisite knowledge is and scope ahead of time what they will be covering.

It needs to be emphasised that once set up this sort of online management only needs to be tweaked thereafter and allows for a more efficient collaborative working environment that decreases the teacher's individual work load.

Relational – Different aspects become integrated into a coherent whole. At this level the online site becomes integral to the learning process. The LMS can be an optional means of studying, with some students doing their course entirely online or blending with face-to-face lectures, tutorials or classes. Each component either fits into a sequential process or is a conceptual segment of the overall learning objectives of the subject. A number of outcome appropriate modes of learning are incorporated and both students and teachers are able to take a more flexible approach,

Extended abstract – The previous integrated whole may be conceptualised at a higher level of abstraction and generalised to a new topic or area. This would be, in effect, an entirely online subject. Although there may be key lectures or “meet ups” the LMS presence

would be the main arena for the subject's teaching, learning and assessment would all be integrated through the LMS using a grade book facility. Problem-based learning and simulations are able to be utilised to their fullest extent using a range of software and resources currently available.

The main advantage of the above multi-level constructivist approach is that teachers can determine where they sit at a particular level, working within its parameters with some degree of comfort in terms of how they utilise the pedagogy and their own technological skills. It also ensures that the use of the LMS avoids the "technocentric" approach that often dominates when teachers uncomfortably adopt technology for its own sake. (Papert, 1987)).

Teachers are able build upon their previous level as they begin to feel comfortable and are able to identify developmentally appropriate pedagogical designs and strategies (Harris, Mishra & Koehler, 2009). Typically one would expect that the first two levels would be utilised by all teachers represented in an LMS. Improvement can be more purposefully achieved by focusing on professional development in the areas of how to meaningfully link associated texts and resources, the relationship between time-based schedules and constructive alignment of objectives, activities and assessment (Biggs, J. B. 2011), and encouraging the reuse of resources so that the program of teaching in the class room, tutorial or lecture correlates with the online site.

Gradual development can be achieved by introducing the basic use of discussion forums and the incorporation of the grading systems available within the LMS. This aspect of the technology alone allows for an efficient shift from singular summative assessment to multiple formative assessments of more educational value (Griffen, 2012).

The advantages that can be achieved in time saved need to be emphasised to encourage uptake and help shift the teaching emphasis from administrative management to more worthwhile engagement with students - which is of course what the LMS is intended to be. The important recommendation is that educators take a more pedagogical approach to their use of ICT and they follow clear principles by which they can determine what this means and how it is embodied in their use of the available LMS technology.

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